Influence of electroless plating on the deterioration of the corrosion resistance of MAO coated AZ31B magnesium alloy

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ABSTRACT

A composite bi-layer film is prepared on AZ31B Mg alloy for corrosion protection by means of micro arc oxidation (MAO) and electroless Ni–P plating. The electroless plating of Ni–P on MAO coated Mg alloy is accomplished based on a St-co-NIPAAm/Pd nanoparticles activator. The structure and corrosion protection are characterized by scanning electron microscopy (SEM), electron probe X-ray micro-analyzer, potentiodynamic polarization measurements in 3.5 wt% NaCl solution and salt spray tests. A compact and continuous bi-layer coating on Mg alloy substrate can be formed via MAO for 10 min and electroless plating coating for 40 min. However, our results show that the bi-layer coating exhibited a much worse corrosion resistance than that of the Mg alloy with a single MAO coating. After a systematical investigation in corrosion behaviors, a possible mechanism for the deterioration of corrosion resistance is proposed in this study.

Keywords: Magnesium alloy; Micro arc oxidation; Electroless Ni–P plating; Corrosion resistance; Salt sp...

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